# Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer




September 2, 2014

Mr. Tom Harmening
City Manager
City of St. Louis Park
5065 Minnetonka Boulevard
St. Louis Park, MN 55416

Mr. John Jones
Director of Regulatory Management
Vertellus Specialties, Inc.
201 North Illinois Street, Suite 1800
Indianapolis, IN 46204

RE: 2013 Annual Monitoring Report
Reilly Tar & Chemical Superfund Site, St. Louis Park, MN

Dear Mr. Harmening and Mr. Jones:

The Minnesota Pollution Control Agency and the U.S. Environmental Protection Agency (EPA) (referred to hereafter as the Agencies), received the "2013 Annual Monitoring Report" submitted on March 17, 2014 (the Report), from Summit Envirosolutions on behalf of the city of St. Louis Park (City). Staff have reviewed the Report and have the following comments:

1) Section 1.0 Introduction:

The Report states: "The CD-RAP relied on pump and treat technology to control polyaromatic hydrocarbon (PAH) concentrations in groundwater in each aquifer containing PAH contamination due to Reilly's activities at the Site. New extraction wells were drilled in the Drift, Platteville, and St. Peter Aquifers for that purpose and the municipal drinking water supply wells in the Prairie du Chien – Jordan Aquifer are pumped at specified minimum rates in accordance with the CD-RAP."

Since the Report shows that not all wells achieved the specified pumping rates, the above statement should be changed to say all wells "are to be pumped at the specified minimum rates in accordance with the CD-RAP." Agencies approved use of SLP11 to be monitored instead of SLP17.

2) Section 4.0 Ironton-Galesville Aquifer:

The Report indicates that the historical analytical results for well W105, from 1988 through 2013, are summarized on Table 2. The overall water quality remains below the cessation criteria. Thus, remedial action goals are being met in this aquifer at the Site.

It is recommended that data from well W105 and all other wells continue to be evaluated, as previously recommended by the Agencies, using Mann-Kendall, or other approved statistical software, to determine if there are statistically significant trends associated with the data.

3) Section 5.0 Prairie du Chien-Jordan Aquifer:

The third paragraph states: "Municipal wells in St. Louis Park and surrounding cities typically pump at 1,000 gpm or more, and have a considerable effect on localized groundwater flow. As a result, it is not possible to measure a regional or local gradient that is unaffected by pumping."

Triangulation using groundwater elevations from SLP5, W118, W403/W402, W407 should be used to obtain this information. It is also recommended that groundwater elevations from wells W118, SLP6, W401 and the Edina Test Well should be considered for use. The agencies suggest checking with the surrounding cities to determine if there is an optimal time to collect data when area municipal pumps are off.

The fourth paragraph states: "The 2013 groundwater monitoring data for the Prairie du Chien-Jordan are shown in Figure 2. Locations that were sampled more than once are labeled with the most recent test results. The groundwater surface shown in Figure 2 was made using water level data and a linear-log kriging algorithm developed by Papadopulos and Associates, Inc. and described in "KT3D_H2O: A Program for Kriging Water Level Data Using Hydrologic Drift Terms" (Karanovic, et al, GROUND WATER, Vol. 47, No. 4, July-August 2009, pp. 580-586) and "Kriging Water Levels with a Regional-Linear and Point-Logarithmic Drift" (Tonkin, et al, GROUND WATER, Vol. 40, No. 2, March-April 2002, pp. 185-193). Summit used the KT3D_H2O computer code with Prairie du Chien – Jordan Aquifer water level data collected in September 2013 to generate the potentiometric surface (groundwater elevation contours) shown in Figure 2."

As the Agencies have previously commented in the 2012 Annual Report review, the KT3D_H2O user manual from Papadopulos states: "Since the linear-log drift accounts for the effects of extraction or injection, water level measured in extraction wells should in general not be used as observations. The kriging code as currently written does not account for linear/non-linear well losses at extraction wells, and hence the drift coefficients (and map) will be biased by these effects." Because of this bias, the potentiometric surface maps provided by Summit overestimate the effect of the pumping wells.

The fifth paragraph states: "In 2013, PAH concentrations in excess of the CD-RAP drinking water criteria were found in samples from well W23 on the Reilly Site and well SLP10 the nearest municipal well (which is preferentially pumped to limit the spread of PAH)."

At this time, the Agencies believe that pumping SLP 10 only provides partial removal of dissolved phase PAHs in groundwater.

The fifth paragraph also states: "The analytical results for samples from well W403 suggest that historic PAH concentrations resulted from debris in the well. Cleanout of well W403 in late 2012 and early 2013 appears to have removed the source of PAH to the well samples."

It is unfortunate that laboratory analysis was not run on the debris removed from the well.

The last sentence of the fifth paragraph states: "PAH concentrations in samples from wells E7 and E13 were lower in 2013 compared to prior recent years."

We request plotting graphs comparing pumping rate and concentrations over time to help understand the variability in concentrations data. As indicated in previous statements, statistical software such as Mann-Kendall should be used to provide trend analysis.

4) Section 6.0 St. Peter Aquifer:

The third paragraph states that the potentiometric surface shown in Figure 3 was made using water level data and the linear-log kriging algorithm developed by Papadopulos and Associates, Inc. As had been previously commented on in the 2012 Annual Report, the KT3D user manual from Papadopulos states: "Since the linear-log drift accounts for the effects of extraction or injection, water levels measured in extraction wells should in general not be used as observations. The kriging code as currently written does not account for linear/non-linear well losses at extraction wells, and hence the drift coefficients (and map) will be biased by these effects." Because of this bias, the potentiometric surface maps provided by Summit overestimate the effect of pumping well W410. Staff at S.S. Papadoulous and Associates should be consulted to determine if there is a method for correcting for well efficiency loss.

At the beginning of the third paragraph, the Annual Monitoring Report (AMR) states: "The flow rate for well W410 averaged 44 gpm for the year, as measured and recorded by the City (Table 7). In prior years well W410 was able to be pumped at a higher rate, and often averaged more than 50 gpm."

The "Pumping of St. Peter Aquifer at Well W410 (1989)" report and the RAP-FS (1990) identified a minimum pumping rate of 65-100 GPM necessary to contain PAH contamination in the St. Peter Aquifer. Therefore, the pumping rate of W410 is not in compliance with the CD-RAP. It is noted that the capture zone of W410 provided in the 1989 report was inferred by the incorrect assumption that groundwater contours are sufficient for depicting capture zone. This assumption likely significantly overestimates the actual capture zone. A proper capture zone analysis should be conducted using appropriate data inputs and use methods recommended by the Agencies: EPA 600/R-08/003, "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems," January, 2008, or use of the KT3D H2O Capture Zone Analysis application in the "Part Track" tab provided that the data inputs are appropriate. The third paragraph states: "The City performed maintenance on the well in 2013 by having a licensed water well contractor redevelop the well to improve its specific capacity. Currently the well can sustain a pumping rate of approximately 40 gpm."

In the Agencies review of the 2012 Annual Report, the Agencies provided a reference for an appropriate well maintenance schedule (Groundwater and Wells, Driscoll). If maintenance activities are not successful in restoring well yield to that which has been specified in the CD-RAP, additional pumping options will need to be implemented to provide full capture of the PAH plume above drinking water criteria.

The third paragraph also states: "The potentiometric surface map in Figure 3 depicts the water surface in September 2013 and shows influence of pumping well W410 at 40 gpm on water levels in the St. Peter Aquifer."

As mentioned in the 2012 Annual Report review, potentiometric surface maps are not a suitable method for calculating capture zone. The Agencies have provided reference material to properly calculate capture zone in previous correspondence. The references include: EPA publication EPA 600/R-08/003 "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems" (Jan 2008) or use of the KT3D H2O Capture Zone Analysis application in the "Part Track" tab provided that the data inputs are appropriate.

The fourth paragraph states: "Well W410 is drawing water and PAH from the vicinity of the Reilly Site into its discharge. Well W129 has shown an increasing concentration of OPAH in recent years, due exclusively to 2,3 dihydroindene. None of the other historical or current Reilly Site monitoring data, in any aquifer, has detected a similar pattern of increasing PAH concentrations due to this chemical. As such, the cause for this increase is unknown but is not attributable to inadequate performance of well W410. If Reilly Site PAH contamination was able to migrate beyond well W410's capture area, other downgradient wells besides well W129 would be affected (e.g., W414, W412, and/or W411) and the number of PAH detected would consist of more compounds than just 2,3 dihydroindene."

Well W129 is located in the western finger of the St. Peter bedrock valley and is likely detecting PAH compounds that are not captured by wells W420 and W421. Well W411 is protected by Platteville Glenwood (PVGW) formation and is unlikely to intercept PAH compounds coming from the Reilly site. Well W412 and W414 are located further to the east and pumping activities from other nearby wells may intercept some of the PAH before getting to those wells.

The Agencies do not concur with Summit's conclusion that the increase in 2,3 dihydroindene is not attributable to the inadequate performance of well W410. Well W410 is not currently pumping at the rate recommended to capture PAH above drinking water criteria. Further, it is likely the estimated capture of well W410 significantly overestimated the actual capture of the well. Also, well W410 is located beneath the PVGW formation which limits the effective capture produced by W410 because the PAH will need be pulled into the bedrock valley to be captured by W410 in the St. Peter Aquifer.

2,3 dihydroindene concentrations may have increased in W129 because W129 is located within the bedrock valley. Increasing concentrations are not observed in W411 because the well is protected by the overlying PVGW formation. Well W412 does not have as high of PAH detections as the other wells because the pumping well, W410, is located between the Reilly source area and W412 and PAHs are intercepted.

2,3 dihydroindene has been detected in other wells and shows a pattern of higher concentrations near the source but has also been detected in wells located further away from the source including well E13. 2,3 dihydroindene appears to be more mobile than many of the other PAH compounds and concentrations are likely increasing due to inadequate capture by the pumping wells. For this reason, it is appropriate to conduct a more comprehensive capture zone analysis. We also request that you provide more information about 2,3 dihydroindene and provide graphs showing 2,3 dihydroindene concentrations over time.

5) Section 7.0 Platteville Aquifer:

In the second paragraph, the Report states that increasing PAH concentrations observed in samples collected from well W426 (Platteville well) "may indicate the effects of pumping well W439 (Drift aquifer) nearby."

The reference to pumping influences of the drift well across multiple aquifers should be tested to determine if that is the mechanism causing increased contaminant movement in the Platteville. PAH movement in the Platteville formation without containment may be occurring. Pumping of the Platteville Aquifer wells should continue to be evaluated during 2014 to determine if they are capable of meeting the performance objectives in the Consent Decree.

In the last paragraph regarding well W421, please provide more information about the dense non-aqueous phase liquid and whether or not it is or was cleaned out.

6) Section 8.0 Drift Aquifer:

Pumping of the Drift Aquifer wells should continue to be evaluated during 2014 to determine if they are capable of meeting the performance objectives in the Consent Decree.

General Comments:

- Groundwater sample analytical data should be evaluated with appropriate statistical methods. Interstate Technology and Regulatory Council provides guidance on groundwater statistics and monitoring compliance that may assist in accomplishing this objective (http://www.itrcweb.org/gsmc-1/).
- In addition to the tables, groundwater analytical data should be presented in graphical form coupled with groundwater elevations at the time of sample collection. This has been previously discussed and agreed to in previous meetings.
- The 2012 AMR had a "Table 3" that provided a Summary of Statistical trends. Please provide a similar table for 2013 information.
- The Mann-Kendall Trend Test was done for the 2012 AMR. We request that this be done again for incorporating 2013 data.
- Please provide updates on the PAH concentrations over time.
- Table 3 does not provide water level data for SLP 6. Provide an explanation in the text.
- Table 6 W24: Provide explanation as to why Total Other PAH was so high in 2012.
- Documentation of Field sample collection data must be provided.

The Agencies' staff appreciate having the granular activated carbon treatment information combined into the Annual Report.

We request a final 2013 AMR that incorporates the Agencies' requests and changes listed above within 30 days receipt of this letter. If you have questions or comments on any points raised herein, feel free to call Nile Fellows, Project Leader, at 651-757-2352.

Sincerely,

Leah Evison
U.S. EPA
Superfund Division
Region V

Nile Fellows
Project Leader, Superfund Unit 1
Site Remediation and Redevelopment Section
Remediation Division

LE/NF:mcb

cc: Mark Hanson, City of St. Louis Park
Jay Hall, City of St. Louis Park
William M. Gregg, Summit Envirosolutions
Carl Herbrandson, Minnesota Department of Health